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CONTROL OF THE AIR : THE PRIMARY AIR POWER ROLE

By

Ajay K Ahlawat, Wing Commander, Indian Air Force

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Advisors: Mr. Budd Jones, ACSC/DEI

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Abstract

General Giulio Douhet wrote in 1921 that, “he who controls the air controls everything”. Almost a century later, the official doctrines of most major air power nations still reflect a similar theme. His contention that control of the air is vital for victory in war was widely accepted and remains so today. Prominent Air power theorist like, Air Marshall Hugh Trenchard, Brigadier General Billy Mitchell and Colonel John Warden, all agreed to the primacy given to winning and maintaining control of the air. Control of the air is assumed to be *primus inter pares* of all the air power roles. The aeroplane as a weapon of war has undergone massive transformation in the ensuing period; however the doctrine of its employment has not changed much. There is need therefore to critically evaluate the primacy given to control of the air amongst various air power roles and analyse if it is valid in all the situations.

CONTROL OF THE AIR : THE PRIMARY AIR POWER ROLE

To have command of the air means to be in a position to wield offensive power so great that it defies human imagination. It means the complete protection of one's own country, the efficient operation of one's army and navy, the peace of mind to work in safety. In short, it means to be in a position to win.

- General Giulio Douhet

Introduction

General Giulio Douhet in his famous; much read and much criticized treatise 'The Command of the Air'(1921), laid great importance on winning and maintaining control of the air. He observed that, "He who controls the air controls everything".¹ His writings suggest that to win in the air means victory, to suffer defeat in the air means the acceptance of whatever terms the enemy likes to impose. For him it was impossible to achieve victory without first achieving what he termed 'command of the air'. Surprisingly, he made this claim barely a few years after WW-I. Airpower at that time was a promise yet to be fulfilled, much less a proven weapon of war. While there is debate on the influence Douhet's work had on early air power theorists in Europe and USA, his contention that control of the air is vital for victory in war was widely accepted and remains so till date, at least amongst the proponents of air power. Prominent air power theorists to include, Air Marshall Hugh Trenchard, Brigadier General Billy Mitchell and Colonel John Warden, all agreed to the primacy given to winning and maintaining control of the air. Control of the air is thus assumed to be *primus inter pares* of all the air power roles. Official doctrines of most major Air Forces consider control of the air as their primary mission.

Aim of this essay is to critically evaluate the statement that, *control of the air takes primacy in various air power roles* and analyse if it is valid in all the situations. Control of Space, though very relevant in modern operations, has been left out of this essay merely for the purpose of confining the scope for more precise examination. I have divided my paper in five parts- origin and

concept, lessons from the past, air superiority and its relation to surface forces, limits of air superiority and implications for the future. We shall begin by tracing the origin of the concept - control of the air.

Origin and Concept

The suggestion that the control of the air was essential for victory was first put forth by Major J.D. Fullerton in 1893.² Presenting his paper, *Some remarks on Aerial Warfare*, at Chicago's World Columbian Exposition, Fullerton concluded with seven propositions about the impact of aeronautics on warfare. One of his propositions was that the speed of the air vehicle would make it necessary for all nations to be ready for lightning war; and sea and land warfare would be possible only when a nation has command of the air. Unfortunately his paper did not receive the attention that it deserved and remained confined to a small circle of aeronautical visionaries. Sir H.G. Wells' book *War in the Air* which was published in 1908 discusses various air power roles in war but falls shy of mentioning control of the air or air superiority as a prerequisite. During the First World War, the airmen begin to understand the concept of air superiority and often discussed it amongst themselves. In 1917, Trenchard briefed Billy Mitchell, "The contest of air superiority began when the airplane began to attack each other and drop bombs. The troops on ground yelled for protection and brought the air force to task for not keeping all enemy airplanes out of the air near them."³ Similarly, the French also realised, after unsuccessful, unescorted bomber raids in Ruhr region that 'victory in the air must come before victory on the ground'.⁴ Around this time various proponents of air power around the world began to write in much clearer terms about the necessity of attaining control of the air. Colonel Edgar Gorell's strategic bombing plan of 1918 reflected the cumulative wisdom of British, French and Italian theories and carried the concept of air superiority far beyond the

battlefield. The war ended before his plan could be tested.⁵ On the other side of the world, Russians established a large army air force called *Voennyoye-Vozdushnyye Sily* (VVS) in 1920. Though the VVS was subordinate to army commands, doctrinally, air superiority was the primary mission.⁶ In 1921 Douhet's book *Command of the Air* was published under the auspices of Italian War Department and is credited by many as the seminal work on air power theory in general and control of the air in particular. From then on the requirement of air superiority as a concept was further developed by various air power theorists in their respective nations.

Interestingly, in the development stage, air-superiority was often understood differently by different people. Some observers interpreted air superiority as the possession of larger air force, while some others equated it with ability to drive the enemy air force into defensive.⁷ Similarly, the ways to achieve air superiority also varied from attacking the enemy aircrafts on the ground to destroying them in the air. Other approaches like destroying the aircraft production line or the destruction of means to sustain air operations (for e.g. oil production) were also propagated. In Britain, Air Marshal John Slessor suggested in 1936, that a nation could gain and maintain air superiority only through a resolute bombing campaign against enemy cities and industries.⁸ In the United States, General Elwood "Pete" Quesada held a slightly different view, and reflected a lack of unanimous agreement on the subject when he stated that, "The fighter business in those days was a bunch of guys going up and fighting another bunch of guys without a known objective."⁹ He elaborated further by stating that the concept of air superiority was "really defined after the Second World War started".¹⁰ The war proved to be the ideal testing ground for various interpretations, and the theory that passed the test of war survived to become a doctrinal principle. Counter-air operations as we know today are the product of that doctrine. We will now examine how the concept is understood in modern times.

Control of the air as an attribute has been defined differently in different publications around the world. However the primacy or absolute necessity of establishing control of the air for success of any operations has not been questioned. For example, British (RAF) Air and Space power Doctrine defines control of the air in terms of freedom and denial as, “The freedom, bound by time, to use a volume of airspace for one’s own purposes while, if necessary, denying its use to an opponent.”¹¹ It adds a caveat that no degree of control of the air guarantees that an enemy will not inflict damage or losses. The USAF doctrine defines control of the air in terms of degree or extent of control. It states, “Various degrees of control are possible. Superiority is that degree of dominance that permits friendly land, sea, and air forces to operate at a given time and place without prohibitive interference by the opposing force. Supremacy is that degree of superiority wherein opposing air and space forces are incapable of effective interference anywhere in a given theater of operations.”¹² The doctrine of the Indian Air Force broadly subscribes to a similar theme but adds the concept of favourable air situation (FAS). It states, “A FAS is limited by time and space to a much greater extent and it offers a lower degree of air dominance. Therefore, a higher degree of enemy interference can be expected. In FAS there is just sufficient dominance to exercise specific capabilities or conduct specific operations.”¹³ FAS is sometimes also referred to as- local air superiority.

It is not always possible or necessary to seek theatre-wide air superiority. Very often local air superiority is adequate. How ‘local’ is local will depend on the time taken to achieve the ground objective. The emphasis is on effectiveness for a given amount of *time* and *airspace*. For example, air superiority over a few hundred miles for a few hours would be enough if the objective is safe passage of a naval fleet through a strait. Similarly, while fighting under air-parity conditions, an air commander can devote all/most air resources for a given time over a given airspace in support of a

ground operation which is crucial to overall objectives. A suitable example would be General Heinz Guderian's crossing of Meuse River in 1940 with his three divisions opposed by three dug in French divisions in fortified defensive positions on the opposite bank. The French failed to protect the skies above their surface forces allowing the Germans to gain local air superiority and eventually succeed in their operation.¹⁴ Another example of local air superiority would be the successful evacuation of British Army at Dunkirk in 1940. The British, though defeated on the ground were able to obtain a FAS over the beaches, allowing the British Expeditionary Force to escape.¹⁵ In sum, the required degree of control in FAS is achieved, when a commander assesses that a planned surface or air operation will not be compromised by enemy action and that the risk to his own forces posed by enemy air is acceptable.

Possessing control of the air does not guarantee success in all operations, but failure to achieve control of the air in situations where a credible adversary air threat exists will hinder the conduct of friendly air or surface activities. Field Marshal Rommel once commented that, "Anyone who has to fight, even with the most modern weapons against an enemy in complete control of the air, fights like a savage, under the same handicaps and with the same chances of success."¹⁶ A careful analysis of past campaigns will reveal that surface forces cannot succeed in their objectives if they are constantly under attack by enemy aircraft. Even airpower cannot exploit its entire range of options in absence of requisite control of the air. Certain specialist airpower roles which are carried out by so called 'slow movers'¹⁷ can only be executed to required degree of satisfaction under the umbrella of air superiority or at least a FAS. Some of these roles are: combat search and rescue, air mobility, C2 aircraft operations (AWACS & JSTARS), air refuelling, counter surface forces operations, UAV exploitation and psychological operations.

Broadly speaking, control of the air enables a nation/coalition to prosecute the fullest range of offensive operations, while preventing effective enemy response. Coming from this are some obvious advantages, particularly what might be termed the 'three freedoms': the freedom of initiative, the freedom to operate and the freedom to manoeuvre.¹⁸ Freedom of initiative refers to the ability of the air-dominant adversary to control the tempo, strategic and tactical thrust, and nature of the conflict. It also forces the adversary in a defensive and reactive mode. Freedom to operate is characterized by the ability of military forces to conduct all of their functions particularly that of attacking a foe, without fear of that foe attacking them in any meaningful or significant way in return. Freedom to manoeuvre means the ability of joint forces to operate unhindered on land and sea within an area of operations.

It is not difficult to assimilate or accept the virtues of air superiority. Given adequate resources, one can conduct all air power missions like counter air, close air support, interdiction and strategic strikes near simultaneously. However, if the enemy has a powerful air force enjoying near-parity in technology and numbers, priority has to be given to achieving control of the air. Given the small size of readily deployable forces and the time required to mobilize larger resources, an opponent need not possess a big air force to achieve parity in the theater. The more the parity or asymmetry in opponent's favour, the more difficult the task becomes. Hence, invariably the counter air campaign should be the primary air campaign during the initial stages of the war. This is not to suggest that no other air power roles be undertaken till air superiority is won. Instead it means that no other operation should be commenced, if it is going to jeopardize the attainment of air superiority, or is going to use resources that should be used to attain air superiority. At the same time, emergent situations may arise when resources needed to achieve or maintain air superiority have to be diverted to other tasks. But such diversions must only be temporary, and they should

never be used as the basis for planning. We will now examine some case studies from the past to understand how the belligerents gained from this understanding or paid dearly for their ignorance in war.

Lessons from the Past

Air superiority is a necessity. Since the German attack on Poland in 1939, no country has won a war in the face of enemy air superiority, no major offensive has succeeded against an opponent who controlled the air, and no defence has sustained itself against an enemy who had air superiority. Conversely, no state has lost a war while it maintained air superiority, and attainment of air superiority consistently has been a prelude to military victory. It is vital that commanders, air, and surface be aware of these historical facts, and plan accordingly.¹⁹

-John Warden

The Spanish Civil War (1936-39) was the first conflict since 1918 in which the opposing parties fielded air forces of nearly comparable size and technical proficiency. In this war the Chief of the Nationalist air forces, General Alfredo Kindelan displayed some understanding of the need to control the air. Kindelan appreciated from the outset that his objective would be placed at risk without control of the air. Since he lacked resources to attain and maintain total air superiority he sought local air superiority for specific operations. From the very outset, Nationalist strike aircraft were targeting the airfields, fighter aircraft, fuel supplies and Republican's air defences.²⁰ Whenever he suspected that his bombers will not go through un-contested, he would provide fighter escort. The primacy given to resource allocation towards winning control of air paid dividends.

Incidentally, their mentors, the Germans did consider air superiority as a pre-requisite for success, however frequently diverted resources for other operations. They tended to use air power as long range artillery in support of their advancing army.²¹ During the *Blitzkrieg* of 1939-1940, the German Luftwaffe was better trained and equipped than its adversaries. Even then it did not wage a proper campaign for the control of air. As a result, overall success notwithstanding, the invasion of

Poland cost the Luftwaffe 285 aircraft, 18% of the operational strength committed to the campaign. Norway and Denmark cost a further 242 airplanes, mostly transports. 21% of the Luftwaffe's combat aircraft committed to the Battle of France were destroyed on operations from enemy action: 1,129 out of 5,349 aircraft.²² They seemed to have learned their lessons after paying in blood and treasure. As it is well known now; the operation *Sealion*: plan for invasion of England was cancelled because of failure of Luftwaffe to provide air superiority.

On the other hand, the Allies started the air war in WW-II with the premise that strategic bombing by unescorted bombers would provide air superiority as a by-product. After suffering considerable losses in the Combined Bomber Offensive (1943), they learned the bitter lesson that air superiority is not a by-product rather a pre-requisite for success in air war.²³ The lesson thus learnt was appropriately applied for operation *Overlord*. There are many examples that make the case for control of the air or air superiority, but none as convincing and as emotive as Normandy landings of 1944. From the outset, control of the air meant everything. Adequate resources were allotted to ensure the same. As a result, less than a month before the invasion, United States Army Chief of Staff, General George Marshall could state with confidence "We are about to invade the continent and have staked our *success* on our *air superiority*, on Soviet numerical preponderance, and on the high quality of our ground combat units." (emphasis added)²⁴ The invasion turned out to be defining moment in military history. Due credit was given to the contribution made by air superiority when Gen Eisenhower told his son two weeks after the landings that if had not had air superiority he would not have been there.²⁵

The absolute requirement to control the air, even when things on ground are not progressing well, was learned in Korean War (1950). The situation on ground in early days was grave to say the least. The surprise North Korean attack had pushed South Korean and American forces to the far

south of the Korean peninsula. With great difficulty, the allies succeeded in establishing a defensive perimeter around the port city of Pusan, one they feared might break any time. Gen Douglas MacArthur realised that it could only be held if his air arm could keep the North Koreans from massing enough men and supplies for a final effort. Allies still controlled the air despite the reverses on the ground. In the critical early period from June to September 1950, air power was almost certainly the margin of survival.²⁶ There was a lot of acrimonious debate between the land and air commander, especially in early desperate stages of the war about what missions should get priority. Land commanders wanted air force to throw everything at ground as close air support, while air force wanted to give primacy to air superiority and interdiction. The USAF prevailed and Korea demonstrated, to 'Air Force Historian' Robert Futrell's satisfaction at least, 'one more historical justification for the overriding priority which USAF doctrine accords to the air superiority mission'. This strategy, he further concluded, 'made the war too expensive for the Communists to continue'.²⁷

The Vietnam War in Asia and later the Yom Kippur War in the Middle East heralded the arrival of surface to air missiles (SAM) and radar controlled anti-aircraft artillery (AAA). Though it is improper to compare these two conflicts on account of their diverse nature, the lessons that emerge for the contest of air are however similar. Suffice to say that proliferation of SAMs and AAA has only increased the emphasis on attaining control of the air. Unless subdued, these weapons deny air power ability to deliver effects. In absence of freedom to operate, air power can do little to support the surface forces without absorbing unacceptable attrition. The task however has become more risky and expensive as demonstrated in every conflict since then.

The end of Cold War has changed the nature of inter-state conflicts, at least for the USA and at least in the short term. The apparent ease with which US led alliances achieved victory in Kuwait, Kosovo, Iraq and Afghanistan has lulled some into believing that the formula for success in war is

not elusive any more. An easy to miss lesson that emerged from these one-sided air wars; the overwhelming technological and numerical superiority that was needed to obtain and maintain such a state of air superiority even after the opposing air force was rendered incapable of any coherent action. Given abundance of resources and technological superiority, the US forces can launch air operations in any sequence. Smaller Air Forces around the world will be in error if they draw similar conclusions. In a near peer conflict of regional nature, the air planner would do well to first win some degree of control of the air before diverting air resources to other tasks. I will present two examples in this regard.

The battle for Falkland Islands in 1982 could have turned on its head if the integral air power of British task force had been unable to at least provide FAS. Royal Navy lost six ships, but could absorb the losses. However sinking of its carriers or troopship Canberra would have been catastrophic. It might have even lead to withdrawal of the task force. Not surprisingly, post-Falklands British maritime doctrine emphatically states that: "The minimal requirement for a successful [maritime] operation is a *favorable air situation*. *Air superiority* will be a requirement for sea control where a robust challenge from the air is possible. *Air supremacy* is a necessary precondition of command of the sea." ²⁸

During India-Pakistan war of 1971, the Pakistani Air Force (PAF) launched pre-emptive strikes on eleven airfields in north-western India. ²⁹ This preemptive strike known as Operation *Chengiz Khan*, was inspired by the success of Israeli Operation *Focus* in the Arab-Israeli Six Day War. But, unlike the Israeli attack on Arab airbases in 1967, which involved almost all the Israeli fighter bombers, Pakistan flew no more than 50 planes to India and failed to inflict the intended damage. ³⁰ Though the Indian runways were cratered and damaged, they were operational by the next day for the IAF to execute its response. There are claims and counterclaims about how the war

progressed after that but suffice to say that this preemptive strike failed to achieve its objective of negating IAFs advantage of numbers. The important lesson that emerges is that, in this quest for air supremacy, there is no place for halfhearted attempts. The PAF copied Israeli air force but failed to deliver the knock-out blow.

Air Superiority and its relation to Surface Forces

*Our idea of air superiority is not that we win the fight like the RAF won the Battle of Britain, but that we win the fight in the other guy's airspace. In Korea, we fought the air superiority battle over the Yalu River. In Vietnam, we fought it over Hanoi. In Desert Storm, we fought it over Baghdad. So **no American soldier presently serving in the Army has ever been attacked by an enemy airplane.** It has been 40 years since we have had anybody come under enemy air attack. If you want to know what it is like to be attacked by an airplane, you have got to go talk to an Iraqi or a North Vietnamese or somebody else.³¹(emphasis added)*

— General Merrill A. McPeak

The weight of historical evidence overwhelmingly suggests that air superiority is crucial to success, and therefore, must be accepted as the first goal in any conflict. Surface forces commanders often fail to realise the real significance, of the importance air forces give to gaining air superiority. They generally consider the CAS as the most appropriate use of air power. They would prefer to have the aircraft available to them as long range artillery or to tackle the enemy planes if they appear. It is futile in their mind to go after airfields or aircraft factories in the quest for air superiority, while the outcome is being determined on the ground. While their view is understandable, if narrow and parochial, explaining the error in their thinking is often frustratingly difficult. The situation becomes more complex in case of a surprise enemy offensive that is either progressing well or seems on the verge of doing so. The ground commander would expect the air force to provide all effort towards CAS expecting it to stop air superiority and interdiction operations until the emergency is over. This can have dangerous consequences, especially if the fight for air superiority is not yet conclusive. In absence of significant air opposition, the enemy can

undertake previously impossible counter air operations to gain air superiority. He may even choose to carry out air attacks on strategic targets or interdict lines of supply. In either case the initiative thus the advantage will lie with him. Notwithstanding this argument, there may be situations or phases in campaign where all available air resources may be required for ground support; more so if the battle in progress is the decisive battle of the war, and losing the battle would mean defeat.

The need for air superiority also extends to maritime operations. Though the US Naval commanders did not widely accepted this view until Japanese attack on Pearl Harbour. The sinking of the British capital ships *Prince of Wales* and *Repulse* by Japanese land-based aircraft in 1941 soon made it clear to British that ships required air cover to operate effectively. The armadas that conquered the central Pacific in World War II were based on aircraft carriers, not battleships, and this emphasis has been reflected in the U.S. Navy's force structure ever since. The planned naval invasion of Britain never took place because the German air force failed to provide air superiority. In the recent times the development of air-sea battle concept in the United States is reflective of greater appreciation of the subject.

Air Superiority is Not a Panacea

Air superiority is not a panacea. It is not a guarantee for success rather an insurance against failure. There is no denying the importance of air superiority, however, the mere presence of air superiority is not an assurance of victory. For ground forces, air superiority provides freedom of action and not freedom from action. Operation Allied-Force was launched by NATO in March 1999 to compel Slobodan Milosevic, to halt human rights abuse against ethnic Albanians in Serbian province of Kosovo. This was essentially an airpower operation with negligible contribution from the ground forces. By mid-May the coalition had achieved air superiority over entire Yugoslavia,

however, ethnic cleansing and Serb atrocities continued well past that point.³² Air superiority has situational limits and these must be understood clearly. I will provide two examples.

Korean peninsula is a peculiar case where the proximity of two opposing forces makes time and tempo of operation the two most crucial attributes. In case of a surprise massive raid by North into South there may not be time to win and maintain air superiority. The air commander might have to throw everything at ground right from the beginning. We all agree that South Korea with US backing will have technological superiority. However with Seoul only an hour from the DMZ, a sudden attack from the North, which maintains about 90% of its force on the border, will not be good news. With N Korea's known advantage of numbers in tanks and artillery pieces, undetected tunnels and initiative on their side the battle could very well turn out to their liking, at least in initial days. In such a case air superiority will be of little help. However if the conflict was to prolong, control of the air will become crucial to success.

Military operations in irregular warfare (IW) are often very complex especially if the insurgency they are trying to counter enjoys local support. The solution normally is possible only through whole of government approach. In addition IW is predominantly a land-centric activity, especially when the adversary merges with the local population effortlessly. Air power is generally employed in supporting role to surface forces. Air superiority provides lesser assurance of success in IW than in conventional warfare. The US learned this lesson in Vietnam and the Soviets in Afghanistan. Even then, control of the air should be the first objective, in absence of which other air power roles like air mobility, ISR and interdiction would be jeopardised.

Since the current adversaries do not have any air power capabilities, this has brought about a perception within large parts of the land forces that resources need not be wasted on gaining control of the air. In fact surface forces are increasingly sceptical of air power's role in such conflicts. US

Army's Field Manual 3-24, *Counterinsurgency* even discourages use of air power stating popular disdain and inaccuracy of air delivered munitions.³³ The FM ignores the two traits that have greatly aided surface forces engaged in IW; precision attack and persistence surveillance. One just has to look at Iraq and Afghanistan. Because of the coalition dominance in airborne ISR, insurgents are unable to mass for a raid or generate any sort of conventional response without being first detected and attacked. These are possible because of the uncontested control of air, which may not remain uncontested in perpetuity or in every situation.

In this regard Western Air Forces have become victims of their own success. Since they did not have to fight hard for control of the air in recent conflicts they take for granted the freedom to operate without interference from the third dimension. Irregular forces are looking for an asymmetry of their own, and may spring a surprise in the near future. This is truer for countries operating outside of large western coalitions. The attack on Srilankan military airbase by Air Tigers of LTTE in 2007 and later over Colombo (capital city) in 2009 is a pointer in this direction.³⁴ The proliferation of Surface to Air Guided Weapons (SAGW) and Man Portable Air Defence Systems (MANPADS) will make the task of gaining control of air more difficult even in IW.

Future

It is always difficult to predict future of warfare with a great degree of accuracy. However a careful analysis of likely conflict areas, potential enemies and weapon systems being fielded and being developed can reveal future challenges. The resounding success of air operations in Kuwait, Serbia, Afghanistan and Iraq clearly demonstrated to both, friends and foe, the military capabilities of a US-led coalition. A singular lesson that ought to have been learned by those who wish to challenge America militarily would be that- it is almost impossible to defeat a coalition led by the

United States, if it is given the time and access to its intended area of operations. Therefore, the only option available to potential enemies, that offers some chances of success will be to apply asymmetrical means to deny access to the operational area. In some of these cases, the enemy might also enjoy the advantage of proximity and shorter lines of communication. Examples could be: potential conflict with Iran in Strait of Hormuz or with China in Taiwan Strait. Anti-access capabilities, especially when coupled with strategies that exploit them, can present a difficult challenge. I will elaborate on this point with China as an example.

China is developing sophisticated capabilities with an aim to prevent the United States from conducting effective power-projection operations in the Western Pacific region. Their investment in ballistic missiles, land-attack cruise missiles, anti-ship cruise missiles (ASCMs), and the battle networks to support them reveal their determination to deny the US forces safe launch bases in the region. China has also covered its eastern borders and littorals with dense integrated air defense system (IADS) comprising over-the-horizon sensors, advanced surface-to-air missile systems, fourth (potentially fifth) generation fighter aircraft, and sophisticated, hardened and dedicated command and control networks. Their attempts towards developing anti-satellite weapons and computer network attack capabilities are also part of the same game-plan.

Against such a threat, control of the air can only be gained by highly survivable platforms that can not only penetrate modern air defense systems but also conduct other offensive missions as well. In addition such air superiority platforms will also have to provide protection to other high value air assets (HVAA) like AWACS, JSTARS, Rivet Joint and Tankers etc. After all, the battle for air superiority is not an event, but a process. The US airpower would rely heavily on advanced fighters like F-22 and F-35, and new generation of stealthy UCAVs in such a scenario. Arguably, there are only a handful of such platforms in the US inventory. Moreover, China is aware of this

key capability and is expected to take measures to neutralize this advantage. China is known to have invested in sensors like OTH radars that can detect LO platforms. China is also known to work on 'swarm' concept, wherein a large number of unmanned interceptors and unmanned submarines will be used to saturate enemy forces. Given sufficient numbers, these less capable platforms can saturate and overwhelm the fighters/bombers in the air and ships in the sea. The US fighters can easily shoot down most of them but at some stage the tyranny of numbers would weigh in. An F-22 Raptor might survive the *swarm* by rapidly maneuvering away from the fight but the slower HVAA would find it difficult to disengage.

There are options to counter such moves but we need to figure them out. One option could be to defeat the swarm by a swarm. The current trend however displays lukewarm response to such suggestions. There is an urgent need to review existing doctrines to ascertain their suitability for fighting and winning in an anti-access environment, and we ought to do it on priority. By insisting on improving technologies of existing platforms rather than focus on emerging systems/technologies, we could be making a mistake. A large fleet of F-22 and F-35 fighters could very well be the *Maginot Line* of future.

Conclusion

Air superiority ultimately provides much more than just freedom of air operations for air forces. It provides information superiority, which allows the entire joint force the freedom to execute their plan without fear of being attacked by enemy air. If enemy air interference continues, the surface operations would get bogged down and the land/naval forces would suffer significant attrition. Air superiority accomplishes two things. First, it permits offensive air operations against any enemy target at a reasonable cost, and second it denies that same opportunity to the enemy.

With the requisite degree of control of air, an air commander with the flexibility and versatility inherent in an air forces, can deliver combat power on the enemy when and where needed to attain military objectives at any level of war. New technologies offer greater automation and reduced risk to the operators. However, they do not affect the fundamental requirement of air superiority for success in war. Similarly, emergence of peer competitors and anti-access environment poses difficult challenges in the fight for control of the air, but do not dispense with the need or necessity to gain such control. Therefore, control of the air is the *primus inter pares* of all the air power roles. It has doctrinal primacy because it enables freedom of maneuver in all of the Service environments:

End Notes:

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1. Giulio Douhet, *The Command of the Air*, trans D Ferrari, Faber and Faber Ltd, London, first published 1927.
 2. Alfred F. Hurley, *Billy Mitchell: Crusader for Air Power*, Indiana University Press, 1975, p 141, 142 and 175. See also *Makers of Modern Strategy*, ed Peter Paret, p 627.
 3. Trenchard quoted in William Mitchell, *Memories of World war I*, New York, ed 1960, p 105. This quote reproduced in *Case Studies in the Achievement of Air Superiority*, ed Benjamin Franklin Cooling, Washington DC, 1994, p 3.
 4. Hurley, *Billy Mitchell* , p 25. See also *Strategic Bombardment before 1939: Doctrine, Planning, and Operations*, Richard Overy, *Case Studies in Strategic Bombardment*, pp. 17-18.
 5. "Lessons Before WW II" W.A. Jacobs, *Case Studies in the Achievement of Air Superiority*, p 7.
 6. Ibid, p 27.
 7. Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany, 1939-1945*, United Kingdom History of Second World War, London, 1961, pp 20-23.
 8. Cooling, *Case Studies: Air Superiority*, p 66.
 9. Ibid, p xvii.
 10. Ibid p xvii.

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11. AP 3000, *British Air and Space Power Doctrine*, pg 38.
 12. USAF AFDD-1. *Air Force Basic Doctrine*, p 29.
 13. Indian Air Force Publication- IAP 2000, *Basic Doctrine of the IAF*, restricted circulation.
 14. Williamson Murray, *Strategy for Defeat: The Luftwaffe 1933-45* (Maxwell Air Force Base (AFB), Ala.: Air University Press, 1983), p 37. "In the 1940 offensive in France, one of the first problems confronting the Germans was how to cross the Meuse River with three divisions opposed by three French divisions dug in on the opposite bank. An attack by Stuka dive bombers offered the key. Guderian explained that he needed to keep the enemy down while he made his initial crossings. A single attack would not accomplish that end. The air force then agreed to provide him with a stream of *Stukas*. The French failed to prevent it, the air attack took place, three divisions crossed the river to overwhelm three defending divisions, and a breakthrough was underway."
 15. Benjamin Franklin Cooling, *Case Studies in the Achievement of Air Superiority*, Washington DC, 1994, p 87. See also Williamson Murray, *Strategy for Defeat: The Luftwaffe 1933-45* (Maxwell Air Force Base (AFB), Ala.: Air University Press, 1983), p 38-39.
 16. Ronald Lewin, *Rommel: As Military Commander*, Ballantine Books, New York, 1972, p. 275
 17. Aircrew slang; helicopters and transport aircraft in their various roles are considered as slow movers as opposed to 'fast jets'. UAVs too at times are included in this category.
 18. Dr. Richard P. Hallion, 1999, *Control of the air: the enduring requirement*, SES, Air Force History and Museums Program Bolling AFB, DC 20332-1111 September 8, 1999, p 4-7.
 19. Col John A Warden, USAF, *The Air Campaign: Planning for Combat*, National Defence University Press, p 10 . This particular quote is often used 'against' Warden by stating Vietnam as an example, wherein the US lost, despite enjoying overwhelming air superiority. In his subsequently published works and lectures, Col Warden qualified these remarks by stating that this is not strictly true in case of Irregular Warfare.
 20. Carl A. Spaatz, '*Ethiopia, China, and the Spanish Civil War*', ed Eugene Morlock Emme , *The Impact of Air Power*, Van Nostrand, 1959, p. 363-7; and R Dan Richardson, "Development of Air Power Concepts and Air Combat Techniques in the Spanish Civil War" *Air Power History*, Spring 1993, p 69-89.
 21. Major Ainsworth M. O'Reilly, USAF, *The Better Blitzkrieg A Comparison of Tactical Airpower, Use by Guderian and Patton* , Air Command and Staff College, Air Force Research Institute, Wright Flyer Paper No. 43, April 2010, Air University Press. "Guderian thought of tactical airpower in the same vein as long-range artillery—adequate for interdiction only." p 3-5.

22. Hallion, *Control of the air*, p 8-9.

23. R Cargill Hall. *Case Studies in Strategic Bombardment*, Air Force History and Museums Program, 1998, "British Strategic Air Offensive in WW II", "American Strategic Air Offensive in WW II" pp. 91-240.

24. General George C Marshall, "*Memo to the Secretary of War*", May 16, 1944, reprinted in Larry I. Bland, ed., *The Papers of George Catlett. Marshall*, v. IV, p. 449.

25. Sebastian Cox, Peter Gray , *Air power history: turning points from Kitty Hawk to Kosovo*, "The second world war as turning point", p 103.

26. Matthew B. Ridgway, *The Korean War*, New York, 1967, p. 244

27. Robert Futrell, *The United States Air Force in Korea 1950–1953*, Air Force History & Museums Program, 1996 pp. 694, 703

28. Royal Navy Directorate of Naval Staff Duties, *The Fundamentals of British Maritime Doctrine*, BR 1806 (London: HMSO, 1995), p. 68. [Emphasis in original text] Additionally, Annex B, "The Falklands War 1982 from the Viewpoint of Doctrine," (pp. 189-195) is a useful summary of the campaign.

29. Kulwant Rai Gupta, *India Pakistan Relations with Special Reference to Kashmir*, Atlantic Publishers, New delhi, 2003, p 172- 173.

30. "Trying to catch the Indian Air Force napping, Yahya Khan, launched a Pakistani version of Israel's 1967 air blitz in hopes that one rapid attack would cripple India's far superior air power. But India was alert, Pakistani pilots were inept, and Yahya's strategy of scattering his thin air force over a dozen air fields was a bust!", p.34, Newsweek, December 20, 1971.

31. Merrill A. McPeak, General, USAF, *Selected Works 1990-1994* (Maxwell AFB, Ala.: Air University Press, 1995), p 141

32. Benjamin S. Lambeth, NATO's Air War for Kosovo, A Strategic and Operational assessment, RAND publications 2001.

33. Department of the Army, Field Manual 3-24, *Counterinsurgency* (Washington: Headquarters Department of the Army, 15 December 2006) Appendix E, para. E-5.

34. <http://www.southasiaanalysis.org/%5Cpapers22%5Cpaper2182.html> accessed on 07 Nov 11. The Tamil Eelam Air Force (TAF) of the Liberation Tigers of Tamil Eelam (LTTE), which came into being without the Sri Lankan intelligence having the least idea about its location and capability, went into action for the first time since its creation in the early morning (12:45 AM) of March 26, 2007. It was a conventional air attack and not a suicide mission. Two aircraft of the TAF flew

over the Sri Lankan Air Force base at Katunayake near Colombo and dropped four bombs. At least three SLAF personnel were killed and about 20 injured.

Also see <http://www.saag.org/papers14/paper1398.html>. Accessed on 07 Nov 11. In another attack on 21 Feb 09 over Colombo at least two people were killed and 44 others injured after two Tamil Tiger aircraft attacked the Sri Lankan capital Colombo.

<http://english.aljazeera.net/news/asia/2009/02/2009220162220942482.html>. Also see Hindu 27 March 2009. In terms of damage they did not achieve much but psychologically they had a far greater impact.

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